Space Weather Forecast

Issued on Saturday, 29 June 2024 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. G1/Minor Storm intervals likely Day 1 (29 Jun), risk declining next few days.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: There are currently thirteen regions on the visible disc, but with most of these regions small and simple. The two largest regions are in the southwest and southeast of the disc, but both appear fairly straightforward magnetically, although the one in the southwest has shown a recent increase in its trailing spots. There are a series of regions in the solar southern hemisphere, all of which individually are fairly straightforward, but their proximity to each other and SDO imagery suggests the potential for magnetic interaction between them. There is a new region rotating onto the northeast limb, which is more than likely not yet fully visible.
No new Earth-directed Coronal Mass Ejections (CMEs) have been observed in coronagraph imagery in the past 24 hours.
Solar Wind / Geomagnetic Activity: Solar winds showed a CME arrival at 28/0910 UTC. Initially background wind speeds jumped as the CME arrived to slightly elevated levels, increasing gradually after the arrival to vary between 450-490 km/s. The Interplanetary Magnetic Field was mostly moderate, but became strong at times between 28/0910-1630 UTC. The north-south component became strongly southward directed after the CME arrival, becoming more variable after 28/1100 UTC. Geomagnetic activity was Active (Kp 4), increasing to reach G4/Severe Storm (Kp 8) between 28/1200-1500 UTC, before easing to Unsettled (Kp 3) by 29/0000 UTC.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Low to Moderate activity is expected with a chance of isolated Moderate-class flares.
Solar Wind / Geomagnetic Activity: A CME arrived at Earth at 28/0910 UTC, with waning CME effects expected to continue into Day 1 (29 Jun). In addition, a faint and weak CME which left the Sun on 25 June is thought to be Earth directed, most likely arriving during Day 1, but with uncertainty in timing. A CME which left the Sun on 27 June has a slight chance of a glancing blow during Day 2 (30 Jun) but this is low confidence. There are no coronal holes on the disc to give any fast wind influence.
Geomagnetic activity is expected to be Unsettled to G1/Minor Storm (Kp 3-5) on Day 1 with a slight chance of further G2/Moderate Storm (Kp 6) intervals, both due to the current CME effects and due to the likely arrival of the weak CME from 25 June. Conditions are then expected to become Quiet to Unsettled during Day 2, but with a slight chance of further Active to G1/Minor Storm intervals should a glancing blow from the 27 June CME occur. **Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is most likely to remain at background levels, but with a very slight chance of exceeding the S1/Minor Storm threshold should any notable flares occur from the numerous sunspots that currently occupy the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	60	20	5	1
Strong	G3	Yes	1	1	1	1
Severe	G4	Yes	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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